

Applicant Name Yellowstone Conservation District
Project Name Modeling Aquifer Responses to Urban Sprawl, West Billings Area

Project Abstract

The west Billings area in Yellowstone County has experienced tremendous growth and development. Most new homes are being built in areas beyond municipal services and these residents depend on shallow aquifers as their only source of potable water. These aquifers are primarily recharged by irrigated agricultural practices; such agricultural land is disappearing into residential developments. The loss of aquifer recharge puts future groundwater availability and quality at risk.

The purpose of this project is to construct a calibrated digital groundwater model of the west Billings area in Yellowstone County. This model will provide a planning tool for managing the rapid growth and urbanization that is occurring. Alternatives such as agricultural easements, green belts, and artificial recharge could potentially offset recharge losses. However, it is not known how much recharge is required to sustain the aquifers or the locations of critical recharge areas. Also, it is not known how fast and where groundwater declines will likely occur. A digital groundwater model can be constructed with the available data to answer these unknowns.

The groundwater model will be developed using the MODFLOW program and will be calibrated to real-world-measured groundwater level and streamflow conditions. This project builds upon a wealth of hydrogeologic information obtained by previous investigations and will use these data to test various development scenarios. Information provided by this project will be critical to planners, resource managers, and area residents. Public meetings will be conducted throughout the project to disseminate information and to gain input and identify concerns. A report and the model set-up data will be publicly available from the Montana Bureau Mines and Geology (MBMG) internet webpage.